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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
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FOREST INSECT INFESTATIONS IN THE
NORTHERN ROCKY MOUNTAIN REGION
DURING 1960

Archibald Tunnock, Jr., Entomologist

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Prepared by the
Forest Insect Laboratory
Missoula, Montana

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An analysis of detection surveys and biological evaluations made by the Missoula Forest Insect Laboratory indicates that infestations of five forest insect species caused considerable damage to forest resources in the northern Rocky Mountain region in 1960. These include infestations of spruce budworm in Douglas-fir, Douglas-fir beetle in Douglas-fir, mountain pine beetle in western white pine, Engelmann spruce beetle in Engelmann spruce, and larch casebearer in western larch.

INSECTS OF ECONOMIC IMPORTANCE

Insects mentioned in this section have caused extensive damage to timber and control measures of one sort or another have been used to combat them during the past year.

DOUGLAS-FIR BEETLE (*Dendroctonus pseudotsugae* (Hopk.)).--Douglas-fir forests in the northern Rockies are affected periodically by Douglas-fir beetle outbreaks. These have occurred about every nine years and seem to last for three or four years. The beetle is the source of the major loss to the region's Douglas-fir resource which is estimated at 29.5 billion board feet.

The last major outbreak in the region occurred during the period 1950-1952. This outbreak was estimated to have destroyed 333 million board feet of Douglas-fir on 973 thousand acres.^{1/}

^{1/} Douglas-fir bark beetle infestation and proposed plan aimed at its control, North Idaho and Western Montana. Progress report of task force, Bureau of Entomology and Plant Quarantine and Forest Service, Missoula, Montana. June 1953.

Another outbreak apparently has begun as beetle-killed trees with red crowns appeared throughout much of the Douglas-fir type this season. Most infestations were scattered within areas that total more than 400 thousand acres. The abundance of infestations within or adjacent to the national forests and national parks in the northern Rockies are as follows:

Area	Infestations
Kaniksu N.F., Idaho	few
Coeur d'Alene N.F., Idaho	few
Nezperce N.F., Idaho	moderately numerous
Kootenai N.F., Montana	numerous
Flathead N.F., Montana	moderately numerous
Lolo N.F., Montana	numerous
Bitterroot N.F., Montana	few
Helena N.F., Montana	few
Beaverhead N.F., Montana	few
Gallatin N.F., Montana	numerous
Lewis & Clark N.F., Montana	few
Yellowstone N. P., Mont., Idaho, Wyo.	few

MOUNTAIN PINE BEETLE (*Dendroctonus monticolae* (Hopk.)).--The mountain pine beetle has been infesting old-growth western white pine stands within the Canyon and Bungalow Ranger Districts, Clearwater National Forest, Idaho, since 1934. During the period 1952-1960 tree mortality has averaged about $2\frac{1}{2}$ percent of the stand--a loss of about 25 million board feet annually. A biological evaluation of infestations on 40,000 acres on these two ranger districts indicated that approximately 40 percent more trees may be attacked in 1961 than were attacked and killed in 1960. Localized infestations of the beetle have also been reported in the Coeur d'Alene, St. Joe, Kaniksu, and Kootenai National Forests of Idaho within mature white pine type.

Mountain pine beetle activity in lodgepole pine stands is still at a low level over the region. Reports from the Sylvanite Ranger District, Kootenai National Forest, showed about 17,300 acres of this host type that contained widely scattered, single, infested trees and small groups of trees. This light infestation has persisted for a number of years.

A chronic infestation in Glacier National Park decreased in intensity from 0.8 infested trees per acre in 1959 to 0.2 trees in 1960. Along the Madison Mountain Range in the Gallatin National Forest, over 30,000 acres of lodgepole pine were badly infested by the rust, Cronartium comandrae. Within this area, there is evidence of a light infestation of mountain pine beetle. A few groups of pine trees inspected contained current beetle broods.

The mountain pine beetle has annually infested small groups of white-bark pine in drainages surrounding Mt. Washburn in Yellowstone National Park. A few scattered groups were spotted again this season.

ENGELMANN SPRUCE BEETLE (Dendroctonus engelmanni (Hopk.)).--Engelmann spruce beetle infestations decreased in northern Idaho and western Montana in 1960. Current outbreaks persisted in the perimeters of several areas that were clear-cut during the past few years to control the beetle. Salvage operations have been planned for the removal of these infested trees. The following tabulation lists the location and status of current infestations reported in several national forests in the region.

National Forest	Ranger District	Extent of infestation
Kootenai	Fortine	15 groups in Grave and Wigwam Creek drainages
	Rexford	Sutton Creek, 160 acres; small groups
	Yaak	Groups in several logged areas
Flathead	Tally Lake	7 groups scattered over district
	Glacier View	335 acres
Lewis & Clark	Teton	500 acres in N. Fork of Waldron Creek
Beaverhead	Ennis	4-6 acres in N. Fork of Meadow Creek
Lolo	Powell	One infestation
	Thompson Falls	One infestation
Kaniksu	Sandpoint	Groups in Snow and Caribou Creeks
	Bonners Ferry	Infestations in 3 compartments

LARCH CASEBEARER (*Coleophora laricella* (Hbn.)).--The larch casebearer spread over practically all of northern Idaho since its discovery at St. Maries in 1957. Although specimens of this pest can now be found in an area well over 8,000 square miles in size, visible defoliation caused by it has so far been confined to the 532 square miles reported during 1960 in the vicinity of St. Maries, Idaho and the adjacent St. Joe National Forest. Most of the defoliation centered in western larch stands on private lands. Defoliation was very heavy this year, but despite this, no tree mortality occurred nor has any occurred from the successive annual defoliations. The infestation appears to be increasing both in area infested and in severity of damage. Approximately 2,500 *Agathis pumilus* (Hymenoptera: Braconidae) adults were released as casebearer parasites at five locations near St. Maries in June. These were received from collections and rearings made at the Forest Insect Laboratory of the Northeastern Forest Experiment Station, New Haven, Connecticut. By the release of the parasitic wasps it is hoped to initiate biological control of the casebearer.

SPRUCE BUDWORM (*Choristoneura fumiferana* (Clem.)).--Many infestations throughout Montana continued in epidemic status. There were small areas of lessened defoliation in 1960, but these were an insignificant part of the total area infested. Surveys indicated that there was no appreciable increase in infested acreage in Montana in 1960. A biological evaluation made in Montana by the Forest Insect Laboratory indicates that much the same infestation conditions prevailed in 1960 as in 1959 in measurements of defoliation and moth population. Egg mass counts show a rather sharp decrease.

	<u>1959</u>	<u>1960</u>
Percent of defoliation	38.0	34.0
Moths per 15" twig	1.11	0.95
No. of egg masses/1000 sq. in. of foliage	10.36	3.63

The small differences, between 1959 and 1960, in the percentage of defoliation and the moth population are not significant.

INSECTS OF MODERATE IMPORTANCE

PINE ENGRAVER BEETLE (*Ips* spp.).--*Ips* beetles were reported infesting ponderosa pine stands in several national forests and on some private forest lands. *Ips oregonis*, the Oregon pine engraver, top-killed some mature trees and infested patches of reproduction over 200 acres in the Ft. Howes Ranger District, Custer National Forest, Montana. The Kootenai National Forest reported 200 acres infested after *Ips* emerged from piles of pine slash on the Warland Ranger District. A few large groups of pole-size ponderosa pines were infested west of Plains, Montana. Several mature ponderosa pines killed on the Kaniksu National Forest contained broods of *I. emarginatus*.

WESTERN PINE BEETLE (*Dendroctonus brevicomis* Lec.).--Outbreaks increased in number in northern Idaho and western Montana during the year. An estimated 100 high risk trees were attacked west of Rexford, Montana. In the Meadow Creek drainage of the Lolo National Forest, beetle broods currently infest mature pines. Small groups of infested ponderosa pines were reported to be scattered over the Kaniksu National Forest and in private lands in the Thompson Lakes area west of Kalispell.

THE FIR ENGRAVER (*Scolytus ventralis* Lec.).--Heavy beetle broods were found in groups of pole-size grand fir trees growing along Idaho State Highway Route 3 near St. Maries. A light infestation, that probably will persist, also killed small grand firs in the Granite Creek drainage west of Clark Fork, Idaho.

NEEDLE MIDGE IN DOUGLAS-FIR (*Contarinia* sp.).--First report of this forest tree pest in this region was an outbreak that suddenly appeared in 1950 between Newport, Washington and Rexford, Montana. The defoliation of Douglas-fir trees was so severe that, in 1952, the Christmas tree harvest in this area suffered an estimated \$1 million loss.

Infestations of this midge appeared again in 1960 and has been found throughout the Douglas-fir type in Montana. Heavy midge populations have damaged Christmas trees ready for harvest in the Superior Ranger District, Lolo National Forest, in the Rexford Ranger District, Kootenai National Forest, and in the Flathead Indian Reservation near Ronan, Montana.

PINE RESIN MIDGE (*Retinodiplosis* sp.).--The epidemic of resin midge that caused severe damage to lateral branch tips in numerous ponderosa pine plantations over the region in 1959 subsided in 1960. Very little current "flagging" of branch terminals was noticeable in an area heavily infested in 1959 near Rexford, Montana. Only 300 acres in the Quartz Creek and Priest River drainages on the Kaniksu National Forest were damaged in 1960, a considerable reduction in the acreage infested in 1959.

PINE TIP MOTH (*Rhyacionia* sp.).--Pine tip moth infestations have persisted for years in the understory ponderosa pine stands in portions of the Custer National Forest in Montana and South Dakota. Some of the heaviest damage occurred last year in the Long Pines area. A biological evaluation was made there in April and again in June. No overwintering pine tip moth cocoons could be found in the duff during April, and current feeding in the pine branch tips was not evident during late June. This seems to indicate that the infestation reached a very low level in 1960.

SAWFLIES.--Two species of sawflies, only recently determined as Neodiprion fulviceps complex and N. nanulus contortae, have defoliated overstory lodgepole and ponderosa pine trees since about 1958 in the Little Rocky Mountains near Zortman, Montana. Some mature trees died as a result. An analysis of sawfly eggs collected in June indicated that 68 percent were nonviable. Fewer trees attacked this year and the absence of cocoons during an examination of the infested area in August were further evidence that the infestation appears to be decreasing.

The larch sawfly, Pristiphora erichsonii (Hartig) was still active in the Blackfoot River drainage northeast of Missoula, Montana but host tree damage was nominal.

Light defoliation by the western larch sawfly, Anoplonyx occidens Ross, is evident on pole-size western larch trees west of Noxon, Montana.

BLACK PINE LEAF SCALE.--Populations of Aspidiotus californicus Coleman on ponderosa pine foliage were greater in the vicinity of Spokane, Washington in 1960 than at any time since March 1950 when unseasonable low air temperatures killed about 85 percent of the populations of this diaspidid pest then epidemic in the area. Evidence of severe damage to host trees was once more common in the area between Spokane and the suburban community of Mead where infestations of fluctuating intensities have persisted since the 1940's.

INSECTS OF MINOR IMPORTANCE

LODGEPOLE NEEDLE MINER (*Recurvaria milleri* Busck).--Numerous trees were reported infested near Zortman, Montana.

DOUGLAS-FIR BARK MOTH (*Laspeyresia fletcherana* (Kearf.)).--Damage by this moth has been increasing for the past few years in Christmas tree stock growing on the Kootenai National Forest. During this year, widespread attacks have occurred in the Pinkham Creek drainage of this forest.

A PITCH NODULE MOTH (*Petrova* sp.).(tentative determination).--A moth that feeds in the cambium of lateral twigs and pupates in formed pitch nodules was quite abundant during 1958 in the crowns of mature ponderosa pine trees near Rexford, Montana. This infestation was reported in January 1960. No current feeding could be detected this past summer.

A PINE SHOOT MOTH (*Eucosma* sp.).--A light infestation was reported in the Libby, Montana area. Killing in 1959 of terminal and lateral shoots of second-growth ponderosa pine trees was obvious during January 1960. Little evidence of current feeding was found this past summer.

WOOLLY PINE APHID (*Pineus* sp.).--This aphid has been under suspicion since 1958 of causing a needle blight on western white pine throughout its range in northern Idaho and western Montana. The aphid's relationship to the blight is still unknown. Needle blight and aphid populations both decreased in severity around Clarkia, Idaho this season.

UNKNOWN MOTH DEFOLIATOR OF LODGEPOLE PINE.--Larvae of a tiny moth defoliated the crowns of pole-size lodgepole pine trees in a dense stand on 1,200 acres in Truman Gulch in the Bridger Mountains, north of Bozeman, Montana.

ENGELMANN SPRUCE WEEVIL (*Pissodes engelmanni* Hopk.).--This weevil has been commonly noted in Engelmann spruce reproduction and reported injuring ornamental trees several times during the year.

AN APHID (*Pineus* sp.).--A moderate population of this aphid was observed on ponderosa pine foliage within the Custer National Forest. During June, adults laid eggs on twigs near the base of needle fascicles.

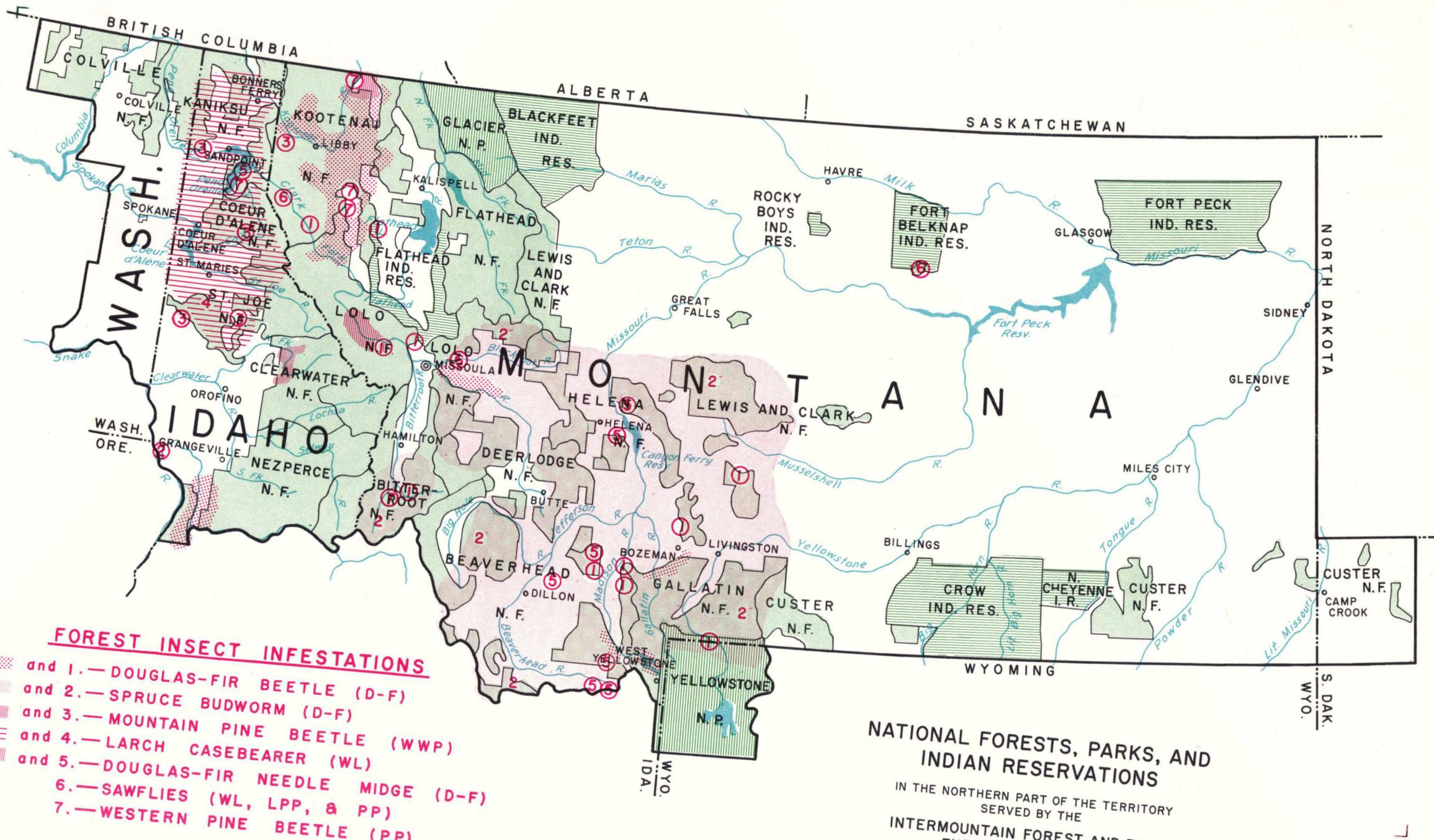
COOLEY SPRUCE GALL APHID (*Adelges cooleyi* Gill.).--A heavy population of this aphid was reported on needles of Douglas-fir trees east of Seeley Lake, Montana during 1960. The aphid is still abundant on ornamental spruce trees in Missoula, Montana.

THE TEN-LINED JUNE BEETLE (*Polyphylla decemlineata* (Say)).--Adult beetles were observed eating needles on a few ponderosa pine trees in Missoula, Montana during July.

PINE NEEDLE SCALE (*Phenacaspis pinifoliae* (Fitch)).--Female scales with eggs were found on a shrub-type ornamental pine in Missoula during March. They also were seen on Engelmann spruce trees in Choteau, Montana and on many ponderosa pines near Ekalaka, Montana.

COTTONY MAPLE SCALE (*Pulvinaria vitis* L.).--Partly-grown scales were detected on the twigs of several silver maple trees in Missoula, Montana during March.

WESTERN BALSAM BARK BEETLE (*Dryocetes confusus* Sw.).--A small infestation of the western balsam bark beetle was discovered attacking sub-alpine fir trees near Mt. Washburn, Yellowstone National Park, Wyoming in August.



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